

PTO/SB/21 (09-04)

**TRANSMITTAL  
FORM**

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Total Number of Pages in This Submission

7

Application Number

10/632,750

Filing Date

August 1, 2003

First Named Inventor

Takata, Yutaka

Art Unit

2818

Examiner Name

Unassigned

Attorney Docket Number

16869K-086100US

**ENCLOSURES** (Check all that apply)

<input type="checkbox"/> Fee Transmittal Form	<input type="checkbox"/> Drawing(s)	<input type="checkbox"/> After Allowance Communication to TC
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<input type="checkbox"/> Reply to Missing Parts under 37 CFR 1.52 or 1.53	The Commissioner is authorized to charge any additional fees to Deposit Account 20-1430.	

**SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT**

Firm Name	Townsend and Townsend and Crew LLP		
Signature			
Printed name	Chun-Pok Leung		
Date	February 1, 2005	Reg. No.	41,405

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Signature			
Typed or printed name	Joy Salvador	Date	February 1, 2005



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

YUTAKA TAKATA et al.

Application No.: 10/632,750

Filed: August 1, 2003

For: DISK CONTROLLER AND  
CONTROLLING METHOD OF  
THE SAME

Customer No.: 20350

Examiner: Unassigned

Technology Center/Art Unit: 2818

Confirmation No.: 4662

**RESUBMISSION OF PETITION TO  
MAKE SPECIAL FOR NEW  
APPLICATION UNDER M.P.E.P.  
§ 708.02, VIII & 37 C.F.R. § 1.102(d)**

**MAIL STOP PETITION**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

The enclosed Petition to Make Special was filed on August 30, 2004. Also enclosed is a copy of the Express Mail label stamped August 30, 2004, the return postcard stamped August 30, 2004, the Transmittal Form, and the Fee Transmittal.

The Petition has not been entered according to Patent Application Information Retrieval (PAIR).

In view of the foregoing, Applicants respectfully request entry of the Petition and issuance of a first Office Action at an early date.

Respectfully submitted,

Chun-Pok Leung  
Reg. No. 41,405

TOWNSEND and TOWNSEND and CREW LLP  
Two Embarcadero Center, 8<sup>th</sup> Floor  
San Francisco, California 94111-3834  
Tel: 650-326-2400; Fax: 415-576-0300  
Attachments  
RL:rl  
60411608 v1

O I P E J  
FEB 03 2005  
PATENT & TRADEMARK



EV 530884649 US

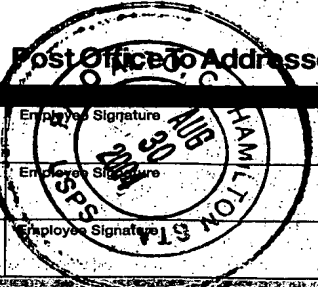
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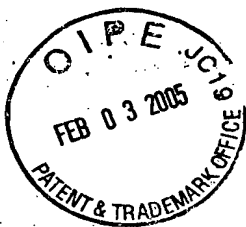
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**TO THE U.S. PATENT AND TRADEMARK OFFICE:**

60295822v1

<b>Application No.:</b> 10/632,750	<b>Docket No.:</b> 16869K-086100US
<b>Confirmation No.:</b> 4662	<b>Attorney:</b> RL:jbs
<b>Due Date:</b> N/A	
<b>Date Mailed:</b> August 30, 2004	

Please stamp the date of receipt of the following documents and return this card to addressee.

- Transmittal Form
- Fee Transmittal (in duplicate)
- Preliminary Amendment (9 pages)
- One (1) Sheet of Annotated Showing Changes of Figure 8B
- One (1) Replacement Sheet of Figure 8B
- Petition to Make Special (9 pages)
- Eleven (11) cited references (U.S. Patent Nos. 5,768,623/6,449,607 B1; U.S. Patent Publication Nos. 2002/0178336 A1, 2003/0105767 A1, 2004/0098543 A1; Japanese Patent Publication Nos. 2000-047952, 06-332782, 2002-163140, 2001-051890, 2000-207370, 08-335144)
- Return Receipt Postcard

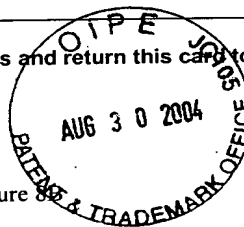
**TO THE U.S. PATENT AND TRADEMARK OFFICE:**

60295822v1

<b>Application No.:</b> 10/632,750	<b>Docket No.:</b> 16869K-086100US
<b>Confirmation No.:</b> 4662	<b>Attorney:</b> RL:jbs
<b>Due Date:</b> N/A	
<b>Date Mailed:</b> August 30, 2004	

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- Eleven (11) cited references (U.S. Patent Nos. 5,768,623/6,449,607 B1; U.S. Patent Publication Nos. 2002/0178336 A1, 2003/0105767 A1, 2004/0098543 A1; Japanese Patent Publication Nos. 2000-047952, 06-332782, 2002-163140, 2001-051890, 2000-207370, 08-335144)
- Return Receipt Postcard





PTO/SB/21 (04-04)

**TRANSMITTAL  
FORM**

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Total Number of Pages in This Submission

23

Application Number

10/632,750

Filing Date

August 1, 2003

First Named Inventor

TAKATA, Yutaka

Art Unit

Unassigned

Examiner Name

Unassigned

Attorney Docket Number

16869K-086100US

**ENCLOSURES** (Check all that apply)

- |  |  |   |
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| <input type="checkbox"/> Fee Attached  | <input type="checkbox"/> Licensing-related Papers  | <input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences     |
| <input checked="" type="checkbox"/> Preliminary Amendment (9 pages)          | <input checked="" type="checkbox"/> Petition to Make Special (9 pages)                           | <input type="checkbox"/> Appeal Communication to TC (Appeal Notice, Brief, Reply Brief) |
| <input type="checkbox"/> After Final   | <input type="checkbox"/> Petition to Convert to a Provisional Application                        | <input type="checkbox"/> Proprietary Information  |
| <input type="checkbox"/> Affidavits/declaration(s)                           | <input type="checkbox"/> Power of Attorney, Revocation Change of Correspondence Address          | <input type="checkbox"/> Status Letter  |
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| <input type="checkbox"/> Response to Missing Parts/Incomplete Application    |  | One (1) Annotated Sheet Showing Changes   |
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**SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT**

Firm or Individual name	Townsend and Townsend and Crew LLP Chun-Pok Leung	Reg. No. 41,405
Signature		
Date	August 30, 2004	

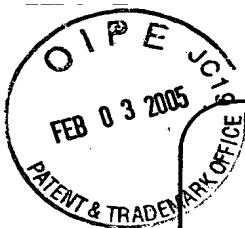
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Typed or printed name	Joy Salvador		
Signature		Date	August 30, 2004

**EV530884649US**

**FEE TRANSMITTAL  
for FY 2004**

Effective 10/01/2003. Patent fees are subject to annual revision.

☐ Applicant claims small entity status. See 37 CFR 1.27**TOTAL AMOUNT OF PAYMENT** (\$) **130.00****Complete if Known**

Application Number	10/632,750
Filing Date	August 1, 2003
First Named Inventor	TAKATA, Yutaka
Examiner Name	Unassigned
Art Unit	Unassigned
Attorney Docket No.	16869K-086100US

**METHOD OF PAYMENT (check all that apply)**☐ Check ☐ Credit Card ☐ Money Order ☐ Other ☐ None☒ Deposit Account:Deposit  
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☒ Charge fee(s) indicated below ☒ Credit any overpayments☒ Charge any additional fee(s) or any underpayment of fee(s)☐ Charge fee(s) indicated below, except for the filing fee to the above-identified deposit account.**FEE CALCULATION****1. BASIC FILING FEE**

Large Entity		Small Entity		Fee Description	Fee Paid
Fee Code	Fee (\$)	Fee Code	Fee (\$)		
1001	770	2001	385	Utility filing fee	
1002	340	2002	170	Design filing fee	
1003	530	2003	265	Plant filing fee	
1004	770	2004	385	Reissue filing fee	
1005	160	2005	80	Provisional filing fee	

**SUBTOTAL (1)**(\$)**0.00****2. EXTRA CLAIM FEES FOR UTILITY AND REISSUE**

Total Claims		Extra Claims		Fee from below		Fee Paid
Independent Claims						
Multiple Dependent						

Large Entity		Small Entity		Fee Description
Fee Code	Fee (\$)	Fee Code	Fee (\$)	
1202	18	2202	9	Claims in excess of 20
1201	86	2201	43	Independent claims in excess of 3
1203	290	2203	145	Multiple dependent claim, if not paid
1204	86	2204	43	** Reissue independent claims over original patent
1205	18	2205	9	** Reissue claims in excess of 20 and over original patent

**SUBTOTAL (2)**(\$)**0.00**

\*\*or number previously paid, if greater; For Reissues, see above

**FEE CALCULATION (continued)****3. ADDITIONAL FEES**

Large Entity		Small Entity		Fee Description	Fee Paid
Fee Code	Fee (\$)	Fee Code	Fee (\$)		
1051	130	2051	65	Surcharge - late filing fee or oath	
1052	50	2052	25	Surcharge - late provisional filing fee or cover sheet	
1053	130	1053	130	Non-English specification	
1812	2,520	1812	2,520	For filing a request for reexamination	
1804	920*	1804	920*	Requesting publication of SIR prior to Examiner action	
1805	1,840*	1805	1,840*	Requesting publication of SIR after Examiner action	
1251	110	2251	55	Extension for reply within first month	
1252	420	2252	210	Extension for reply within second month	
1253	950	2253	475	Extension for reply within third month	
1254	1,480	2254	740	Extension for reply within fourth month	
1255	2,010	2255	1,005	Extension for reply within fifth month	
1401	330	2401	165	Notice of Appeal	
1402	330	2402	165	Filing a brief in support of an appeal	
1403	290	2403	145	Request for oral hearing	
1451	1,510	1451	1,510	Petition to institute a public use proceeding	
1452	110	2452	55	Petition to revive - unavoidable	
1453	1,330	2453	665	Petition to revive - unintentional	
1501	1,330	2501	665	Utility issue fee (or reissue)	
1502	480	2502	240	Design issue fee	
1503	640	2503	320	Plant issue fee	
1460	130	1460	130	Petitions to the Commissioner	130
1807	50	1807	50	Petitions related to provisional applications	
1806	180	1806	180	Submission of Information Disclosure Stmt	
8021	40	8021	40	Recording each patent assignment per property (times number of properties)	
1809	770	2809	385	Filing a submission after final rejection (37 CFR § 1.129(a))	
1810	770	2810	385	For each additional invention to be examined (37 CFR § 1.129(b))	
1801	770	2801	385	Request for Continued Examination (RCE)	
1802	900	1802	900	Request for expedited examination of a design application	

Other fee (specify) \_\_\_\_\_

\*Reduced by Basic Filing Fee Paid **SUBTOTAL (3)**(\$)**130.00****SUBMITTED BY**

Name (Print/Type)		Registration No. (Attorney/Agent)		Telephone	
Chun-Pok Leung		41,405		650-326-2400	
Signature		Date		August 30, 2004	

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PATENT  
Attorney Docket No.: 16869K-086100US  
Client Ref. No.: 632/SM

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re application of:

YUTAKA TAKATA et al.

Application No.: 10/632,750

Filed: August 1, 2003

For: DISK CONTROLLER AND  
CONTROLLING METHOD OF  
THE SAME

Customer No.: 20350

Examiner: Unassigned

Technology Center/Art Unit: Unassigned

Confirmation No.: 4662

**PETITION TO MAKE SPECIAL FOR  
NEW APPLICATION UNDER M.P.E.P.  
§ 708.02, VIII & 37 C.F.R. § 1.102(d)**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

This is a petition to make special the above-identified application under MPEP § 708.02, VIII & 37 C.F.R. § 1.102(d). The application has not received any examination by an Examiner.

(a) The Commissioner is authorized to charge the petition fee of \$130 under 37 C.F.R. § 1.17(i) and any other fees associated with this paper to Deposit Account 20-1430.

(b) All the claims are believed to be directed to a single invention. If the Office determines that all the claims presented are not obviously directed to a single invention, then Applicants will make an election without traverse as a prerequisite to the grant of special status.

(c) Pre-examination searches were made of U.S. issued patents, including a classification search, a computer database search, and a keyword search. The searches were performed on or around July 12, 2004. The classification search covered Class 710 (subclass 6), Class 711 (subclasses 162 and 170), and Class 714 (subclass 2), and was conducted by a professional search firm, Kramer & Amado, P.C. The computer database search was conducted on the USPTO systems EAST and WEST. The keyword search was conducted in Classes 709 (subclasses 203, 218, 223, and 226), 711 (subclass 112), and 714 (subclasses 5 and 6). The inventors further provided references considered most closely related to the subject matter of the present application (see references #6-11 below), which were cited in the Information Disclosure Statement filed with the application on August 1, 2003.

(d) The following references, copies of which are attached herewith, are deemed most closely related to the subject matter encompassed by the claims:

- (1) U.S. Patent No. 5,768,623;
- (2) U.S. Patent No. 6,449,607 B1;
- (3) U.S. Patent Publication No. 2002/0178336 A1;
- (4) U.S. Patent Publication No. 2003/0105767 A1;
- (5) U.S. Patent Publication No. 2004/0098543 A1;
- (6) Japanese Patent Publication No. 2000-047952;
- (7) Japanese Patent Publication No. 06-332782;
- (8) Japanese Patent Publication No. 2002-163140;
- (9) Japanese Patent Publication No. 2001-051890;
- (10) Japanese Patent Publication No. 2000-207370; and
- (11) Japanese Patent Publication No. 08-335144.

(e) Set forth below is a detailed discussion of references which points out with particularity how the claimed subject matter is distinguishable over the references.



A. Claimed Embodiments of the Present Invention

The claimed embodiments relate to a disk controller and a method of controlling the same to provide high performance.

Independent claim 1 recites a disc controller comprising a network controlling unit configured to receive a data input/output request sent from an external device through a network; and a disc controlling unit formed in the same circuit board in which the network controlling unit is formed, the disc controlling unit coupled to the network controlling unit by an internal bus provided in the circuit board. The disc controlling unit is configured to receive a command sent from the network controlling unit through the internal bus and executes a data input/output for a disc drive in response to the command. The network controlling unit is configured to send the command, for which a plurality of addresses are set, to the disc controlling unit. The disc controlling unit is configured to receive the command and executes data input/output corresponding to each of the addresses set in the command for the disc drive.

Independent claim 13 recites a disc controller comprising a network controlling unit configured to receive a data input/output request sent through a network; and a disc controlling unit formed in the same circuit board in which the network controlling unit is formed, the disc controlling unit being coupled to the network controlling unit by an internal bus provided in the circuit board, receiving a command sent from the network controlling unit through the internal bus, and inputting/outputting data to/from a disc drive in response to the command. The plurality of circuit boards connected so as to be capable of communicating with each other are provided. An occurrence of faults of one of the circuit boards is detected by one of the other circuit boards by exchanging a heartbeat message among the circuit boards. When the occurrence of the faults of one circuit board is detected by one of the other circuit boards, the circuit board different from the circuit board causing the faults substitutes for a processing of the circuit board causing the faults.

Independent claim 14 recites a controlling method of a disc controller having a network controlling unit configured to receive a data input/output request sent from an external device through a network; and a disc controlling unit formed in the same circuit board in which the network controlling unit is formed. The disc controlling unit is connected to the network controlling unit by an internal bus provided in the circuit board, receives a command sent from the network controlling unit through the internal bus, and inputs/outputs data to/from a disc drive in response to the command. The method comprises, by means of the network controlling unit sending one command, for which a plurality of addresses are set, to the disc controlling unit; and by means of the disc controlling unit receiving the command and executing data input/output corresponding to each of the addresses set in this command for the disc drive.

One of the benefits that may be derived is the high speed and high reliability with which the processing of the disk controller can be performed.

B. Discussion of the References

None of the following references disclose or suggest a disc controlling unit formed in the same circuit board in which the network controlling unit is formed, the disc controlling unit coupled to the network controlling unit by an internal bus provided in the circuit board.

1. U.S. Patent No. 5,768,623

This reference discloses an architecture which uses host adapter cards that can reside in the host and can control numerous arrays. A plurality of adapter cards is used. Each adapter has controller functions for a designated storage array. There is a host application interface between an application program running in the host computer 20 and the adapter 22. When a data request is made by an application program to a first adapter A through a host application interface for data that is stored in a storage array not primarily controlled by the first adapter, the data request is communicated through the adapter communication interface

23 to the adapter B primarily controlling the storage array in which the requested data is stored. See column 2, line 45 to column 3, line 30; column 3, line 57 to column 4, line 27.

2. U.S. Patent No. 6,449,607 B1

This reference discloses a disk storage device 100 having a modifiable data management function. The disk storage device is connected to an interface 105 which connects to a network 110. A processor 103 carries out an object management program 350 for converting a control command containing physical address information of the disk storage medium 101 and feeds the converted control command to the disk controller 102. In response to an object management modification request given by the user through the network 110 and the network interface 105, the processor 103 carries out the object management modification program 320 to modify a function of the object management program 350. See column 2, lines 32-65; column 4, lines 18-39.

3. U.S. Patent Publication No. 2002/0178336 A1

This reference discloses a storage subsystem capable of effecting remote copy of write data among a group of storage subsystems without being affected by an increase in the load of data writing by a specific host computer among a plurality of host computers connected to the storage subsystems. The storage subsystem includes a first storage subsystem 1 connected to a plurality of host computers 3 via a first interface 2 and a second storage subsystem 7 connected to the first storage subsystem 1 via a second interface 6 so as to copy write data written in the first storage subsystem from the host computer onto the second storage subsystem from the first storage subsystem, thereby protecting the write data in the first and the second storage subsystems in a multiplex manner. See Figure 1 and [0016]-[0026].

4. U.S. Patent Publication No. 2003/0105767 A1

This reference discloses a method for interfacing of SAN (Storage Area Networks) and NAS (Network Attached Storage), and prevents data miss even when a trouble occurs, and makes it possible that an arbitrary number of NAS interfaces access the same file system with high performance. The storage subsystem 100 includes a plurality of interfaces (110, 120, 130, 140, and 150) for the connection to the external network (600 and 700), a plurality of disks 171 to which the plurality of interfaces are accessible, and a shared memory 180 to which the plurality of interfaces are accessible, wherein the plurality of interfaces are loaded with one of the block interfaces for executing an I/O request in disk blocks, and file interfaces are loaded with file servers for executing an I/O request in files. See Figure 1 and [0016]-[0021].

5. U.S. Patent Publication No. 2004/0098543 A1

This reference relates to a storage subsystem which is capable of performing exclusive control of input/output processing requests without need for imparting to the host processing system. The storage subsystem is comprised of a control unit 12 incorporating a control memory 124, wherein information concerning the extent (range) of an input/output processing request which is transferred from a given one of plural host processors to the control unit upon issuance of the input/output processing request from the former is stored in the control memory with a view to realizing the exclusive control for a plurality of input/output processing requests issues from a plurality of host processors to one logical device. See [0001], [0006]-[0007] and [0024-0027].

6. Japanese Patent Publication No. 2000-047952

This reference discloses a means of efficiently performing I/O processing while minimizing the use of processor, main storage, and system bus resources of a server computer by directly transferring data between a network card and an I/O device such as a network adapter or disk controller. In the network file server system, in processing a remote

file system request by a network card, data is directly transferred between a disk controller and the network card. The number of times the data transfer uses main memory between the disk controller and network card is decreased so that high speed processing is enabled.

7. Japanese Patent Publication No. 06-332782

This reference discloses a technique to prevent the throughput due to the centralization of access requests in a specified file server from plural clients, in a file server system where plural file servers accessing each file storage devices are arranged side by side via a network. The master file server provides a file control means by using a load information table to measure and control the load status of each file server, and a file attribute table that records and controls the file server in charge of access to every file block, selecting a file server where the load is light at the time of writing a file.

8. Japanese Patent Publication No. 2002-163140

This reference discloses a storage system that has a scalability capable of fully coping with the band expansion of a network at a low cost. The storage system is comprised of a storage device capable of storing file data, a plurality of file servers performing file processes in response to requests on file data to the storage device, and a file server managing the transfer processes of the file requests received from clients via an external network to the file servers. An internal network connects the response processes to the clients for the file requests, the storage device, the file servers, and the file server.

9. Japanese Patent Publication No. 2001-051890

This reference discloses a decentralized file server system. The system is equipped with servers decentralized in the network and a virtual decentralized file system mounted on each of the servers. Modules judge whether or not their servers are optimum servers capable of handling requests according to server information holding parts, holding mapping tables between the virtual decentralized file system, all the local file systems, and the server information on all the servers.

10. Japanese Patent Publication No. 2000-207370

This reference discloses a technique to provide a distributed file management system which can make appropriate load distribution by means of plural server computers for generating, referring to, and updating files. The distributed file management system is comprised of server computers, client computer groups, and a network. The server computer contains a storage device which records partial files, a network interface, a partial file management section which controls the write and read of the partial files, a status management section which holds load information, and a distributed file management section.

11. Japanese Patent Publication No. 08-335144

This reference discloses a technique to improve reliability and performance of an external storage device, and to provide non-stop maintenance by distributing a load to the plural storage controllers of redundant configuration. Plural disk drive controllers of redundant configuration for controlling a disk device are connected to a host device by the same SCSI ID. These controllers monitor the mutual operating states and set the load distribution information by interposing a communication mechanism and a common managing table in a normal state. High performance is provided by distributing the load by simultaneously operating the plural disk drive controllers, but in case of fault or maintenance, non-stop operation and non-stop maintenance are provided by executing a switching operation at the degeneracy, and recovery can be achieved by disconnecting on the side of the fault.

Appl. No. 10/632,750  
Petition to Make Special  
August 30, 2004

PATENT

(f) In view of this petition, the Examiner is respectfully requested to issue a first Office Action at an early date.

Respectfully submitted,



Chun-Pok Leung  
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